



NIGERIA



Report on the Medical Services for the Year 1946

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Report on the Medical Services for the Year 1946

INTRODUCTORY TO ANNUAL REPORT

In a general survey of the work carried out during the year, progress has been made in many directions, with increased hope for co-ordination and expansion of all the existing facilities. Some limitation has been imposed on these advances by shortage of staff, but there are now in being or in training preventive services for dealing with Malaria, Leprosy, and other endemic and epidemic diseases on the touring team principle. These methods were found effective in dealing with outbreaks of louse-borne typhus, smallpox and cerebro-spinal fever; while field work in conjunction with personnel of the Yellow Fever Research Institute, following a recurrence of Yellow Fever in Yoruba country, was likewise invaluable and involved mass immunisation, combined with the use of modern larvicidal sprays and powders.

One of the most noteworthy and popular advances was the continued increase of mother and child welfare work by Government and other Institutions throughout the whole southern area. In this field expansion is only limited by lack of materials and shortage of building labour. Despite this shortage, however, in many cases additions have been made in existing buildings.

School hygiene generally has improved with increased realisation of its importance.

The necessity for nutritional improvement in Africans was amongst the subjects discussed at an Anglo French Medical Conference at Accra in November, at which Nigeria was represented.

Appendices to this report include a short summary of the main conclusions reached at this Conference, the report of the Laboratory Services, and reports on the Medical and Pharmacy Schools, the Dental Service, the Sleeping Sickness Services and on Minesfield Medical Activities.

I.—ADMINISTRATION

A.—STAFF

Shortage of qualified staff continues to retard progress in Medical Work, but towards the end of the year, advice was received from the Colonial Office which points to an early improvement in recruitment. This should at least allow of the implementation of the plan to decentralize departmental administration in accordance with the new constitution, but unless a further improvement in recruitment takes place it will prove impossible to carry out the development programme as it was originally planned. The opening up of new Medical Centres will have to be deferred, but much can still be done with available funds to improve facilities in existing institutions and to increase work in the field of preventive medicine.

Three Regional Deputy Directors have been appointed as Advisers to the Chief Commissioners at Ibadan, Kaduna and Enugu for the respective Western, Northern and Eastern regions, with one Senior Medical Officer for each Medical Division as follows :—

Western Region	..	..	..	Ibadan
Northern Region	..	..	..	Zaria, Jos, Kano, Minesfield and Sleeping Sickness Service.
Eastern Region	..	..	..	Aba, Cameroons and Enugu.

Lagos is treated as a separate entity, the Senior Medical Officer communicating direct with Medical Headquarters and not through a Regional Deputy. The authorized staff at Central Headquarters of the Department in Lagos now consists of the Director of Medical Services, the Deputy Director of Medical Services and two Assistant Directors of Medical Services. The complete re-organisation proposed includes two additional Assistant Directors to allow for relief duties and leave for the above personnel. The ultimate re-organisation for Medical Administrative Divisions will provide for :—

- (1) Lagos : as above.
- (2) The Western Region : Divisional Headquarters at Abeokuta for the Abeokuta-Ijebu Provinces, Ibadan for the Oyo-Ondo Provinces and Benin for the Benin-Warri Provinces.
- (3) The Northern Region : Divisional Headquarters at Ilorin for Ilorin-Niger Provinces, Zaria for Zaria-Sokoto Provinces, Kano for Kano-Katsina Provinces, Maiduguri for Adamawa-Bornu Provinces, Jos for Bauchi-Plateau Provinces and Makurdi for Benue-Kabba Provinces.
- (4) The Eastern Region : Divisional Headquarters at Enugu for Onitsha-Ogoja Provinces, Aba for Owerri-Calabar Provinces and Victoria for the Cameroons.

During the year additional provision was made for three Regional Deputy Directors.

2. The position in regard to shipping has been the cause of continuation of extended tours, and it would seem that until transport by sea improves in quantity, further and increased use of air transport of heavy type is advisable to ensure the more rapid turn-over of leave personnel.

B.—LEGISLATION

LIST OF ORDINANCES, REGULATIONS, ETC., AFFECTING PUBLIC HEALTH ENACTED DURING THE YEAR 1946

(1) ORDINANCES

<i>Serial No.</i>	<i>Date</i>	<i>Short Title</i>	<i>Provisions</i>	<i>Gazette No.</i>
15	11.7.46	The Medical Practitioners and Dentists (Amendment) Ordinance 1946.	Injections given by unqualified persons are made illegal.	29 of 11.7.46
16	11.7.46	The Registration of Nurses Ordinance, 1946.	Establishment of Nursing Council and Registration of Nurses.	29 of 11.7.46
17	11.7.46	The Public Health (Amendment) Ordinance, 1946.	Definition of " Health Officer " in the principle Ordinance.	29 of 11.7.46
23	21.11.46	The Dogs (Amendment) Ordinance, 1946.	Delegation of powers by a Chief Commissioner or the Commissioner of the Colony to a Resident or District Officer under section 16 (1)	62 of 21.11.46

(2) REGULATIONS

<i>Serial No.</i>	<i>Date</i>	<i>Short Title</i>	<i>Provisions</i>	<i>Gazette No.</i>
16	23.3.46	The Hospital Fees (Leprosy) Regulations, 1946.	Hospital Fees are made payable by private leper patients.	23 of 11.4.46
18	26.4.46	The Dogs (Importation and Quarantine) Regulations, 1946.	Disposal of uncertificated dogs imported into the country.	26 of 2.5.46

(3) ORDERS-IN-COUNCIL

<i>Serial No.</i>	<i>Date</i>	<i>Short Title</i>	<i>Provisions</i>	<i>Gazette No.</i>
2	4.2.46	The Pharmacy (Date of commencement) Order-in Council, 1946.	Operative dates of the Pharmacy Ordinance, 1945.	12 of 14.2.46
4	11.2.46	The Births, Deaths and Burials (Jos Military and Public Cemeteries) Order-in-Council, 1946.	Cemeteries for African Soldiers in Plateau Province, Jos.	14 of 21.2.46
8	8.3.46	The Public Health (Application to Warri Urban Districts) Order-in-Council, 1946.	Bake-houses, etc., rules applied to Warri Urban Districts Rules 2 of 1917.	18 of 14.3.46
11	26.4.46	The Public Health (Application to Obubra) Order-in-Council, 1946.	Obubra Area re Application of Cap. 56.	26 of 2.5.46
17	3.6.46	The Yellow Fever (Ogbomoshosho Area) Order-in-Council, 1946.	Compulsory inoculation against yellow fever at Ogbomosho.	31 of 3.6.46
19	14.6.46	The Public Health (Application to Ajagbodudu Adjoining Areas) Order-in-Council, 1946.	Application of sections 11 and 45 to the Crown Estate, Ajagbodudu.	35 of 20.6.46
23	29.6.46	The Yellow Fever (Oyo Province and the Ilorin Division) Order-in-Council, 1946.	Compulsory inoculation against yellow fever.	37 of 1.7.46
28	16.8.46	The Births, Deaths and Burials (Ikoyi Cemetery No. 3) Order-in-Council, 1946.	Opening of new Cemeteries in Lagos.	46 of 22.8.46
29	16.8.46	The Births, Deaths and Burials (Closing of Lagos Cemeteries) Order-in-Council, 1946.	Closing of old cemeteries in Lagos	46 of 22.8.46
37	22.11.46	The Births, Deaths and Burials (Muyuka Cemetery) Order-in-Council, 1946.	African Cemetery—Victoria—insertion.	64 of 28.11.46

(4) RULES

<i>Serial No.</i>	<i>Date</i>	<i>Short Title</i>	<i>Provisions</i>	<i>Gazette No.</i>
2	8.3.46	The Midwives Rules, 1946.	Rules made by the Midwives Board.	14 of 21.2.46
6	11.7.46	The Public Health (Ajagbodudu Adjoining Area) Building Rules, 1946.	Buildings in Cowan Estate, Ajagbodudu to comply with rules.	40 of 18.7.46
8	13.9.46	The Midwives (Amendment) Rules, 1946.	Amendment of sub-rule A of rule 28C of Rules No. 2 of 1946.	53 of 26.9.46
9	1.11.46	The Midwives (Amendment No. 2) Rules, 1946.	Amendments of "direction to" to "Rule/s, etc."	60 of 7.11.46

C.—FINANCE

3. Below are financial statements for the financial year 1945-46 :—

A.—MEDICAL, HEALTH AND LABORATORY SERVICES

	£
Total Revenue, 1944-45	105,182
Total Revenue, 1945-46	120,780
Total Expenditure, 1944-45	638,698
Total Expenditure, 1945-46	691,656
Increase	52,958
Nett Increase	37,360

B.—SLEEPING SICKNESS SERVICE

	£
Total Expenditure, 1944-45	37,938
Total Expenditure, 1945-46	40,547
Increase	2,609

C.—LEPROSY CONTROL

	£
Total Expenditure, 1944-45	1,421
Total Expenditure, 1945-46	26,191
Increase	24,770

D.—MEDICAL STORES

4. The supply position has improved only gradually during the year, despite increasing call for supplies.

5. The African staff position has improved, but resignations caused a two-third reduction in European staff.

6. Nigeria worked strictly to the minimum of essential medical requirements during the war years and the work involved in the rehabilitation of hospitals and new development has compensated for the final dwindling of Bulk Indenting on the Crown Agents and distribution throughout the year.

7. During the year the following were despatched :—

Registered letters and parcels	5,336
Store Issue Vouchers	10,238
Packages	9,986

8. Re-opening of Medical Stores, Kaduna, the buildings of which were used by the Military Authorities during the war, is in the present programme of requirements to allow of the combined needs of the Sleeping Sickness and Epidemic Team Services and the Native Administration Stores.

II—PUBLIC HEALTH—GENERAL REMARKS

European Health

9. The malaria rate calculated in European Hospital in-patients for the year is 18.9 per cent, a considerable drop in rate following a progressive fall over the last few years.

Comparative figures are :—

1941	1942	1943	1944	1945	1946
44%	35.4%	30%	27.5%	25.8%	18.9%

10. Taking the figures for all non-native patients (in and out-patients) the rate is computed at 10.2 per cent. The total non-native population of Nigeria is reckoned at 7,370 giving a malarial morbidity rate of 21.8 per cent with a mortality rate of 0.07 per cent, the malaria being almost entirely subtertian. There have been five blackwater fever cases recorded during the year.

11. The general health of the white population on the whole has been good, with, in addition to malaria, secondary anaemias, dysenteries of various types and minor respiratory and digestive troubles the most prevalent forms of illness. It is noteworthy that there is an increasing number of non-native children included in the figures and an increasing number of pregnancies coming to term in Nigeria.

12. *Invaliding figures for officials (non-native):—*

Total population (officials)	..	..	..	..	..	..	2,362
Invalidings	..	..	94	Deaths	..	..	8
Rate of invaliding—3.97 per cent (of which 42 per cent could be labelled psychosomatic).							

African Health

13. Figures for the last three years were :—

	1944	1945	1946
In-patients	.. .. 97,048	106,083	116,429
Out-patients	.. .. 947,341	866,449	1,002,244

14. Malaria has been responsible in the African population also for a good deal of sickness, a total of 99,730 cases being reported, that is 9 per cent of the total cases seen at Hospitals, a figure not far below that of the non-immune European. It has been estimated that malaria accounts for between 0.3 and 2.5 per cent of all admitted cases, and between 8 and 14 per cent of all African out-patients, while mortality rates in all malarial cases admitted varies between 0.02 and 0.05 per cent. In children, however, up to the age of ten years in Lagos for the ten year period up to 1946, the malarial mortality rate is computed at 9 per cent; over the last five year period this has averaged 4.5 per cent. Fourteen cases of blackwater fever with three deaths occurred in Africans.

15. Diseases of Skin, Cellular tissues, bones and organs of locomotion were responsible for 18.4 per cent of the totals.

16. Respiratory diseases (excluding tuberculosis) accounted for 8 per cent.

17. The incidence of infectious, intestinal and helminthic illness was 8 per cent. Diseases of Pregnancy, child-birth and other puerperal states accounted for 1.3 per cent of the total.

18. The numbers of cerebro-spinal fever cases under hospital treatment were 572 as against almost three times this number in 1945.

19. Smallpox cases were approximately the same as last year.

20. The figures for pulmonary tuberculosis and bone tuberculosis show a slight increase over last year.

21. Venereal diseases present as great a problem as ever, with some decrease in syphilis but an increase in gonorrhoea, the figures being respectively of 17,549 and 29,563 as against 18,751 and 23,717.

22. In this connection the Dermatologist made a comprehensive survey preparatory to tackling this disabling social problem. It would seem that there is a considerable amount of sulpha-resistant gonococcal infection generalised, particularly in the Eastern Provinces, and

large scale preventive (and curative measures) would seem to entail prohibitive costs and increase in specialised personnel beyond present capabilities. A local modified experimental unit might, however, be more feasible as a start in this serious state of affairs.

23. African invalidings were 270 with 16.3 per cent of these due to pulmonary tuberculosis.

Leprosy Service

24. Through the Central Leprosy Unit started in 1945 the Service has been co-ordinated under a Senior Leprosy Officer with three Area Superintendents at Onitsha, Owerri and Benin, Warri areas. Control of these areas has aimed at :—

- (1) The establishment of local treatment centres ;
- (2) The segregation of infectious cases ;
- (3) Comprehensive surveys and propaganda ;
- (4) The protection of uninfected children of leprous parents ; with the existing Leprosy Settlements as organising centres.

With the exception of Medical Officers, the staff has become fairly adequate during the year and standardisation of records from all areas has been introduced to facilitate clerical work.

25. Laboratory work supervised by a European Biochemist appointed by the British Empire Leprosy Relief Association has been instituted at Uzuakoli for routine investigations, research and antigen supply for general use.

26. Hospital accommodation has been inadequate at Oji River and Ossiomo, but good general training at all settlements has been possible for African personnel.

27. In general, extension of local treatment, segregation in villages and attempts to improve the housing conditions of resident patients have improved the morale of sufferers from the disease, who are also encouraged by the fact that the numbers of patients discharged under observation are rising. Maintenance work by patients for the settlements and useful agricultural and arboricultural work has been continued with the provision of adult and child education.

28. Rural work has been aided by the increasing co-operation of the population in all areas with improving results from segregation. Surveys have been pressed in all areas and in these Leprosy Inspectors, Literature and Posters all play their part. Selected areas are being subjected to intensive survey by Specialist Staff. Definite progress has been made during the year with encouraging prospects for the future.

29. The following are relevant figures for 1946 :—

Cases under treatment	..	..	..	..	..	..	61,177
Cases discharged under observation	..	..	..	..	..	..	878
Treatment with Hydnocarpus Oil	..	..	..	..	..	..	2,234,695
Hospital admissions	..	..	..	..	..	..	2,535
discharges	..	..	..	..	..	..	2,522
deaths	..	..	..	..	..	..	67
Segregation Cases	..	..	..	..	..	..	7,096
Bacteriological Examinations	..	..	..	..	..	..	25,128

30. Useful advice has been afforded during the year by the visits of the Rev. A. E. Payton, of the British Empire Leprosy Relief Association, Dr Chesterman, representative of the Conference of British Missionary Societies and Dr Muir, Medical Secretary of the British Empire Leprosy Relief Association.

31. In addition to the Central Government Leprosy Service there are smaller detached units, supervised by Missions, etc., in scattered areas. Continued maintenance of these has been effected with the ultimate idea of co-relating all into a comprehensive scheme of control.

32. Figures for these minor treatment centres give an additional 6,016 in-patients and 984 out-patients.

Lunacy

33. With the prospective appointment of an Alienist Officer there should be possible in the near future a more detailed survey and organised scheme for the control and treatment of mental disease than heretofore. There has been little change in 1946 from the pre-existing conditions, except that a tentative site for a large mental hospital has been chosen at Abeokuta, and if a reasonable supply of water can be assured, the work of construction will shortly be put in hand.

School of Medicine

34. Reference to this should be made in the Appendix. Forty-two graduates are now in practice and, with the partial recognition of the school by the London Colleges, some of these are likely to be proceeding for further study to the United Kingdom.

Native Authority Dispensaries

35. Comparative figures for the Northern and Southern Provinces are given below :—

	<i>Northern Provinces</i>		<i>Southern Provinces</i>	
	1945	1946	1945	1946
Cases treated	580,604	675,914	1,007,490	1,099,347
Total attendances	3,200,298	2,828,538	3,118,972	3,402,388

Hospital Buildings

36. Accommodation in many areas limits the extent of the hospital work possible. This is especially noteworthy in regard to Maternity and Ante-natal work.

37. At Enugu, the transfer of Army wards will be used in the near future to provide a further sixty to ninety beds.

38. Plans for extension of staff quarters at Ogoja and the completion of hospital buildings at Abakaliki are in progress, while at Adeoyo Hospital, Ibadan, the construction of a thirty-bed ward and Maternity block has been almost completed.

39. At Akure, work has commenced on a new hospital and nine new dispensaries have been opened.

40. At Offa, hospital building has been in hand and this institution will be opened once a reasonably adequate water supply has been secured.

41. Extension to the existing Maternity Hospital was completed at Calabar, and at Umuahia a new labour ward of temporary materials was finished.

42. At Degema and Bauchi, re-housing of staff, one of the long needed features, has been accomplished.

43. At Minna, a new Maternity Ward and Isolation Block were completed while a thirty-bed Army ward is in the process of conversion.

44. Construction of the new hospital at Victoria was completed during the year and provision of electric light should permit of its opening early in 1947.

III—VITAL STATISTICS

45. No changes have been made in the registration of births and deaths, those of all non-natives being compulsorily registrable throughout the country. While registration for the local population is in force for most of the larger townships, some endeavour has been made in the North to extend the scope of this to more rural districts.

46. In this connection detailed registers of births and deaths were successfully kept for three of the larger towns in Katsina Province, and in the latter part of the year this registration has been extended to many of the Katsina Emirate districts with a view to further extension over the whole province in the future. These innovations have been found possible with the training of village scribes in registration work.

47. As Lagos figures are the most accurate, comparative results with 1945 are given :—

	1945	1946
Estimated population	174,200	176,500
Births (live)	7,804	8,060
Crude birth rate (per 1,000)	45	46
Deaths	4,051	3,362
Crude death rate (per 1,000)	23.3	19
Deaths within first year of life	996	884
Infant Mortality (per 1,000)	128	109.7
Still births	259	285
Rate of still births (per 100 live births)	3.3	3.5
Deaths from diseases of pregnancy and childbirth	76	93
Maternal mortality (per 1,000 live births) ..	9.8	11.53

IV—HYGIENE AND SANITATION

I—PREVENTIVE MEASURES

(i) *Mosquito and other Insect-borne Diseases*

(a) *Malaria*

48. The anti-malarial work in Lagos area has been aided very greatly by the creation of a Malarial Control Service under a Malariologist and Entomologist.

49. Swamp reclamation in North-east Ikoyi has been completed to the benefit of the amenities, and the saving in maintenance costs of recurrent palliative measures, should be considerable.

50. D.D.T. experiments were carried out extensively in the Railway Compound at Ebute Metta where it was found that under normal conditions once-monthly spraying as an anti-mosquito measure was efficient, combined with more general anti-mosquito control.

51. Swamp Drainage: Malarial swamps at Ebute Metta, New Ijora, Olodi, Railway Reservation and Surulere have been drained, covering a total acreage of 1,040 acres, with the construction of three miles of sea walls, thirty miles of drainage channels and four large sluices. Swamp acreage dealt with to date is 3,760 acres, and the Lagos programme should be completed by March, 1947, leaving only the Victoria Beach Road and East Yaba Areas to be continued. Progress with the programme has enabled some reduction to be made in African Labour Staff in the later months of the year.

(b) *Entomological Section*

52. The appointment of a Medical Entomologist with the Malarial Laboratory and Mosquito Service has ensured the centralising of control in one Malarial Unit and the use of larvicidal measures in a unified way.

53. 300 Mosquito Catching Stations were set up in Lagos and its environs to follow up the use of larvicides with weekly visits for capture, identification and dissection of mosquitoes. Results indicate a substantial reduction in the Anopheline density of Lagos. In support of this, on only two occasions since the start of the service has the anopheline density of Lagos exceeded one mosquito per catching station per day. The anopheline density of Ikoyi has ranged between 1.0 and 0.1 and it is noteworthy that in Apapa, where in 1942 up to 500 anophelines were taken from a single army tent *day after day*, an average of more than one anopheline per catching station per week has now become extremely rare.

54. A total of 5,866 anophelines showed an infectivity rate of 1.8 per cent, the figure for Ikoyi for 304 dissections being 0.65 per cent.

55. A Malarial Survey of Lagos has been commenced, with spleen and blood estimations in village children, school children and infants attending Welfare Clinics. Investigation of malaria in pregnancy is also being pursued. Present figures indicate a spleen rate of 58.5 per cent and of 811 examined 66.3 per cent showed malarial parasites in the blood. This work is being extended into 1947.

56. The use of teams for malaria field surveys of the Northern Provinces with an Entomologist in charge is being put in hand for the near future.

57. *Paludrine*.—In regard to the use of paludrine as a causal prophylactic, it would seem that the M.R.C. recommended dose of .1 gramme twice weekly of paludrine, following Fairley's work at Cairns, should replace the suppressive drugs, mepacrine and quinine in the future.

58. It was considered in June, 1946, that there was at the present time no adequate control for large scale experimentation in the African immune population, and in view of this, no such investigation was undertaken.

(b) *Yellow Fever*

59. Yellow fever re-appeared in epidemic form for the first time for some years. In all, forty-nine cases with eleven deaths occurred, the centre of the outbreak being at Ogbomosho in the Oyo-Ondo Area, a large Yoruba town with an exceedingly high aedes index. Thanks to D.D.T. along with intensive anti-amaryl inoculation, the disease was rapidly brought under control, over 400,000 inoculations being carried out and almost 28,000 rooms sprayed in Oyo Province with pyrethrum and D.D.T. This was accomplished by two health units under a Sanitary Inspector and five Orderlies. In the Northern Provinces too, intensive measures of the same type brought the total field anti-amaryl inoculations up to 447,471 while a further 353,744 rooms were thoroughly dealt with.

60. In the Opobo Area, monkeys infected with Yellow Fever were noted during investigations by a Yellow Fever Research Officer.

(c) *Plague*

61. No cases were reported in 1946.

62. In Lagos, more than 7,000 rats examined for plague gave negative results; a flea count in 557 rats showed a flea index of 3.3 and a cheopis index of 1.8.

63. Eight ships were fumigated with cyanide.

64. In Port Harcourt, examinations and dissections of rats caught, gave a flea index of 2.9 and a cheopis index of 1.58. All smears were negative for plague from 2,990 rats, and also from 9,469 rats at Calabar.

(d) *Trypanosomiasis*

65. See special report--Appendix.

(ii) *Epidemic Diseases*

(a) *Smallpox*

66. 7,620 cases of smallpox with 1,015 deaths were reported during the year compared with 6,720 cases with 1,117 deaths in 1945, showing death rates of 13.3 per cent and 16.6 per cent respectively. The most severe outbreak occurred in the Bauchi area early in the year. Mass vaccination campaigns were again carried out in the Northern Provinces and further extensions of this and active measures against other epidemic (and endemic) disease will be possible later by the use of individual epidemic teams now under training. Mass vaccination in the Cameroon areas in 1945 seems to have had a beneficial effect as evidenced by the smaller number of cases reported there during the year under review.

67. Vaccinations performed during 1946 numbered 2,006,846.

(b) *Cerebro-spinal Meningitis*

68. There has been considerable decrease this year, 3,107 cases with 482 deaths being reported as against 9,628 cases with 1,443 deaths last year, a mortality rate of practically the same. Extensive use was made of sulpha drugs in treatment. Most of the cases notified were again from the Northern and Eastern areas.

(c) *Enteric Fever*

69. Seventy-two cases in all were notified during the year, almost all *b. typhosus* infection. Four of these occurred in Europeans, three of them on board ship before entering the country.

(d) *Dysenteries*

70. A total of 12,743 was recorded of which about one-quarter were amoebic in origin.

(e) *Typhus Fever*

71. For the second year in succession a fairly severe outbreak of louse-borne typhus occurred, in this instance at Kano. There were fifty cases with twenty-three deaths amongst the mendicant types of the population. The outbreak reached its peak towards the end of February but was rapidly brought under control by intensive disinfestation carried out by an augmented sanitary staff with the use of D.D.T. powder, combined with pyrethrum spraying for infected areas. A total of 283,815 people were deloused and 22,498 compounds dealt with. In all, ninety cases with thirty-one deaths were reported during the year, a smaller outbreak recurring at Jos in June where the same measures were effective. The advantage of modern methods over the old laborious steam disinfestation was again clearly demonstrated.

72. Apart from these cases, nine murine typhus cases were noted in Lagos by the port authorities.

(iii) *Other Infectious Diseases*

(a) *Tuberculosis*

73. A total of 1,562 pulmonary tuberculosis infections was noted during the year, a considerable rise over last year, and of other forms of tuberculosis 676, almost the same number as before. In Lagos, 406 cases with 224 deaths occurred and it is suggested that urgent requirements are mass radiography and expansion of existing facilities. A campaign similar to that being waged against leprosy would seem to be required for adequate control of this killing disease in the African, though some improvement should occur with increased sanitary facilities and prevention of over-crowding, which is still only too frequent.

(b) *Pneumonias*

74. There is little change to report in regard to lobar pneumonia—totals being 4,134 with 213 deaths, almost the same incidence and mortality rate as before.

75. Broncho pneumonias numbered 3,777, as against 2,242. As there are so many broncho pneumonias secondary to malaria, helminths and other infections, they have been separated from the lobar types above.

(c) *Undulant Fever*

76. Four cases were reported during the year.

(d) *Rabies*

77. One human fatal case of rabies was noted during the year : three human brains and ninety animal brains were examined for rabies, and of these, thirty-two canine and one human brain gave positive results. These positives were from scattered areas of Nigeria, Lagos itself having ten positives.

(e) *Yaws*

78. This disease continues to be extremely common in the Eastern Provinces particularly, over 34,000 cases being reported. It would seem that the only way to deal with this cause of child illness and subsequent disabilities is the use of touring teams on the Sleeping Sickness Service Scale.

(f) *Helminthic Infections*

79. Predominant findings in 30,520 faeces examinations made by the Laboratory Service have been ascaris, hook-worm and trichiuris infections.

(g) *Onchocerciasis*

80. Very little Onchocerciasis has been reported during the year ; in all eight cases only ; and there seems little association with blindness from reports received. This is at variance with some recent publications on the subject and requires further investigations particularly in the Kumba area of the Cameroons, where the incidence is probably higher than is thought. Positive cases have been recorded previously at Abeokuta, Bida, Enugu, Gusau, Ilorin, Jos, Kano, Kumba, Minna, Owerri, Port Harcourt and Afikpo.

II — GENERAL MEASURES

(a) *Sewage Disposal*

81. Extension of composting sites has proceeded generally and there has been extension of disposal acreage at Ibadan. For the most part shallow trenching is used in the Eastern Areas : possibly night-soil towers are more effective in the wetter parts of Nigeria than other methods. Further experimenting with composting is in progress.

(b) *Refuse Disposal*

82. Refuse has been used as before for incineration and reclamation of swamp areas.

(c) *Water Supply*

83. In general, there seems to be room for considerable improvement in water supply in the outlying stations. For the bigger townships, water supply has been generally adequate in quality.

84. The use of water galleries on the Indian Cholera-prevention plan for Northern areas in the prevention of guinea-worm is noteworthy.

III—SCHOOL HYGIENE

85. In Lagos, school clinics have been well attended and there has been increased co-operation of Headmasters in the use of clinics and dispensaries with the provision of facilities for dealing with refractive errors, of which a total of 960 cases was seen and 280 referred for Specialist Examination.

86. Routine medical examination of 1,175 school children was carried out in thirteen schools, as well as other visits by School Medical Officers. Broadcast Health Talks were also given, and lectures and demonstrations provided in first aid and minor ailments for teaching staff.

87. In addition, routine dental examination of schools has been started.

88. In the provinces, general medical examination by Medical Officers and visiting personnel, has been continued. Gratifying features in many schools are the good level of training in hygiene, uniform efforts to attain satisfactory standards of lighting, school seating, ventilation and waste disposal, and efforts to provide adequate diets for basal nutrition. Schistosomiasis and splenomegaly figures are still high among school children in Northern areas.

IV—LABOUR CONDITIONS

89. Much to be seen in the Labour Camps of the Sapele-Benin Health Areas is commendable. In all but the poorest, Maternity Units with Dispensaries cater for sickness and welfare, and conservancy and refuse disposal obviate environmental nuisances. Over-crowding with its attendant ills is often prevalent however. This is also obvious in less progressive townships and even in Lagos with its influx of ex-servicemen and others in search of employment: methods, *e.g.* legislation, are being put in hand for the better control and distribution of labour.

90. Two new camp extensions to plantations in the Calabar Area were commenced with well maintained camp hygiene. Another new colliery camp at Enugu is almost completed and existing ones have been maintained satisfactorily in most respects. Plantation Dispensaries in the Sapele-Benin area show a total of 22,433 cases with eighty-three in-patients treated.

V—FOOD IN RELATION TO HEALTH AND DISEASE

91. There is still a very great amount of sub-standard nutrition throughout Nigeria generally, and as this is an economic problem it is not likely to be helped by the continued high price levels of foodstuffs. Controlled experimental work, with provision by the Veterinary Department of milk for schools, has been started in Danbago and Shahuchi Elementary Schools in the Sokoto and Katsina Provinces, with a view to finding out if any improvement will occur in the physique and well-being of children. Gross deficiency diseases are not the rule in Nigeria.

VI—PORT HEALTH WORK AND ADMINISTRATION

92. No sea port or airport has been declared infected during the year. Ikeja airport has reverted to Government control, and Lagos Town Council has taken over the Apapa area external to the Wharfs and Dockyards.

93. There have been no outbreaks of major infectious disease in the port of Lagos or in other ports, and no case of quarantinable infectious disease occurred on ships. The following are comparative figures for 1945 and 1946 in Lagos environs :—

	1945	1946
Smallpox	155	123
Typhus (murine)	16	9
Cerebro-spinal Meningitis ..	10	3

No infectious diseases were notified in other ports.

94. Forty-six malarial cases were noted in merchant seamen and control of malaria in these men has been aided by a Ministry of Transport lay propaganda officer.

Yellow Fever

Anti-amaryl.—Inoculation of all regular staff at Ikeja aerodrome is being proceeded with and anti-aedes measures with larvicides instituted.

95. *Smallpox.*—There were no outbreaks of smallpox in the port or township areas of Lagos. 1,599 vaccinations and re-vaccinations were performed on crews and deck passengers.

96. Anti-venereal measures for merchant seamen have been in continuous use at Apapa and the African Hospital, Lagos, prophylactic treatment being provided in 21,014 cases.

VII—TRAINING OF HEALTH PERSONNEL

97. The Native Administration Sanitary Overseers School at Ibadan has had a good year's work and a full-time tutor is being appointed, the ultimate aim for the Western Provinces being a full Sanitary Inspectors Training School preparing for the Royal Sanitary Institute Examination, with supplementary courses.

98. All the twenty-four Government Sanitary Inspectors in training who completed their course in the Public Health Department, Lagos, in 1946, were successful in the Royal Sanitary Institute Examination for Sanitary Inspectors in British West Africa. Two Lagos Town Council Inspectors, three Gold Coast candidates and three Inspectors from the Northern Provinces were also successful.

99. Practical training has been given to ex-service Sanitary Orderlies and they should form a useful cadre for practical work in the future.

VIII—MATERNITY AND CHILD WELFARE

100. Except in the Northern Provinces, Maternity and Child Welfare development is very promising. It is a development with spectacular results and is likely to continue in a manner only limited by the staff and accommodation available. Improved rural supervision by Grade II Midwives with a certain amount of knowledge of the pitfalls, which trap the completely ignorant, has produced increased and earlier attendances at Hospitals and Dispensaries, with beneficial results to mothers and infants, and there is evidence from the figures that this development is extremely popular in the Southern Provinces.

101. In the North, however, even in Kano and Katsina Provinces, two of the most progressive, there is little evidence that much progress in this respect has yet been made. Welfare Clinics and trained Northern Maternity Attendants are projected for the future but progress can only be slow.

102. In Lagos, homes visited by Health Visitors were 56,882 and there was a marked increase in Clinic Attendances over 1945 figures, the figures being 12,866 in Lagos, and 6,160

in Ebute Metta. Motherless children were helped by the free issues of milk, soap and garments. Food and bathing demonstrations have been given and a display by the Infant Welfare Branch of the Health Department was held during a Social Services Week. The number of children on the register totalled 7,260 with 19,026 attendances.

103. In other areas, Mission Hospitals of various denominations undertake a great deal of Maternity and Infant Welfare work and provide training schools for Grade II Midwives.

104. In Massey Street Hospital, Lagos, ten candidates passed Grade I Midwifery examinations during the year. 2,232 obstetrical cases were treated and 3,074 total admissions to the Hospital made during the year, with a total of 5,454 ante-natal new out-patients ; these figures showing considerable increases over 1945.

105. A new ante-natal clinic was opened in December, at Ebute Metta.

106. In Aba, thirteen Grade I Midwives were in training during the year.

107. The number of deliveries in Government and Native Authorities Institutions was:—

1945	1946
15,772	18,114

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1946

EUROPEANS AND AFRICANS

<i>Diseases</i>	<i>In- patients</i>	<i>Deaths</i>	<i>Out- patients</i>	<i>Deaths</i>
1. (a) Typhoid fever.. ..	59	8	7	—
(b) Paratyphoid fever	6	1	—	—
2. Typhus	89	8	3	—
3. Relapsing fever	17	1	1	—
4. Undulant fever	1	—	3	—
5. Smallpox	618	103	68	—
6. Measles	186	5	559	—
7. Scarlet fever	6	1	1	—
8. Whooping cough.. ..	55	2	598	—
9. Diphtheria	3	2	3	—
10. Influenza :—				
(a) with respiratory complications ..	44	—	200	—
(b) without respiratory complications ..	—	—	—	—
11. Cholera	—	—	—	—
12. Dysentery :—				
(a) Amoebic	1,455	86	2,820	2
(b) Bacillary	430	28	453	—
(c) Unclassified	1,459	86	6,126	—
13. Plague :—				
(a) Bubonic	—	—	—	—
(b) Pneumonic	—	—	—	—
(c) Septicaemic	—	—	—	—
14. Acute Poliomyelitis	10	1	16	—
15. Encephalitis lethargica	2	—	—	—
16. Cerebro-spinal fever	500	137	73	—
17. Rabies	1	1	5	—
18. Tetanus	442	163	96	—
19. Tuberculosis of the respiratory system	1,061	282	501	—
20. Other tuberculous diseases	407	37	269	—
21. Leprosy	174	10	881	—
22. Venereal Diseases :—				
(a) Syphilis	6,558	72	11,040	64
(b) Gonorrhoea	5,724	17	21,498	—
(c) Other Venereal Diseases	797	2	2,114	—
23. Yellow fever	11	10	—	—
24. Malaria :—				
(a) Benign	50	1	259	—
(b) Subtertian	4,033	66	19,024	—
(c) Quartan	6	2	3	—
(d) Unclassified	5,407	93	72,555	—
25. Blackwater fever	15	3	4	2
26. Kala-azar	5	—	2	—
27. Trypanosomiasis	869	26	1,551	—
28. Yaws	393	7	33,543	—
<i>Carried forward.. ..</i>	—	—	—	—

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1946—*contd.*

EUROPEANS AND AFRICANS

<i>Diseases</i>	<i>In- patients</i>	<i>Deaths</i>	<i>Out- patients</i>	<i>Deaths</i>
<i>Brought forward..</i>	—	—	—	—
29. Other protozoal diseases	14	—	2	—
30. Ankylostomiasis	1,224	9	3,041	—
31. Schistosomiasis	863	7	1,669	—
32. Other Helminthic diseases	1,754	5	58,500	—
32a Onchocerciasis	3	—	5	—
33. Other infectious or parasitic diseases ..	1,826	57	7,830	—
34. Cancer and other tumours :—				
(a) Malignant	199	47	207	—
(b) Non-malignant	838	14	1,353	—
(c) Undetermined	170	13	275	—
35. Rheumatic conditions	1,639	5	102,543	—
36. Diabetes	105	6	174	—
37. Scurvy	6	1	51	—
38. Beriberi	97	9	939	—
39. Pellagra	54	8	1,179	—
40. Other diseases :—				
(a) Nutritional	118	7	3,482	—
(b) Endocrine glands and general ..	118	12	1,195	—
41. Diseases of the blood and blood-forming organs	1,695	106	20,039	—
42. Acute and chronic poisoning	52	9	8	—
43. Cerebral heamorrhage	338	56	370	—
44. Other diseases of the nervous system ..	1,226	106	10,126	—
45. Trachoma.. ..	124	—	411	—
46. Other diseases of the eye and annexa ..	1,615	3	30,680	—
47. Diseases of the ear and mastoid sinus ..	301	—	22,454	—
48. Diseases of the circulatory system :—				
(a) Heart	942	215	1,577	1
(b) Other circulatory diseases	1,757	40	8,880	1
49. Bronchitis.. ..	3,112	48	69,734	—
50. Pneumonia :—				
(a) Broncho pneumonia.. ..	2,844	269	933	—
(b) Lobar pneumonia	3,086	213	1,048	—
(c) Otherwise defined	—	—	—	—
51. Other diseases of the respiratory system	1,046	52	9,377	—
52. Diarrhoea and enteritis :—				
(a) Under two years of age	204	32	3,747	—
(b) Over two years of age	2,029	139	32,538	—
53. Appendicitis	271	8	213	—
54. Hernia, Intestinal obstruction	5,533	118	5,550	—
55. Cirrhosis of the liver	163	46	64	—
56. Other diseases of the liver and biliary passages	673	82	2,784	—
<i>Carried forward..</i>	—	—	—	—

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1946—*contd.*

EUROPEANS AND AFRICANS

<i>Diseases</i>	<i>In- patients</i>	<i>Deaths</i>	<i>Out- patients</i>	<i>Deaths</i>
<i>Brought forward.. ..</i>	—	—	—	—
57. Other diseases of the digestive system ..	3,287	97	116,187	1
58. Nephritis :—				
(a) Acute	318	66	475	—
(b) Chronic	349	66	425	—
59. Other non-venereal diseases of the genito-urinary system.. ..	7,421	125	26,246	—
60. Diseases of pregnancy, childbirth and the puerperal state :—				
(a) Abortion	1,186	8	891	—
(b) Ectopic gestation	29	3	52	—
(c) Toxæmias of pregnancy	614	32	970	—
(d) Other conditions of the puerperal state	10,618	171	599	—
61. Diseases of the skin, cellular tissue, bones and organs of locomotion	16,280	167	192,932	—
62. Congenital malformation and diseases of early infancy :—				
(a) Congenital debility	696	151	1,614	—
(b) Premature birth	253	86	2	—
(c) Injury at birth	21	9	11	—
63. Senility	79	32	123	—
64. External causes :—				
(a) Suicide	18	1	1	1
(b) Other forms of violence	9,559	253	88,049	—
65. Ill-defined	1,252	154	9,722	—
Total	118,912	4,324	1,015,553	72

LABORATORY SERVICE

Headquarters of the Laboratory Service are the Medical Research Institute, Yaba, and the Pathological Department, African Hospital, Lagos, where the staff consists of an Assistant Director of Laboratory Service, three Pathologists, two Senior Laboratory Attendants, four Laboratory Attendants and a Librarian on loan from the Medical Research Council to re-organise the Library, in addition to four clerical and thirty-nine technical African personnel.

The work done has consisted of administration and correlation of the Laboratory Service of Nigeria, Clinical Pathology, Histo-Pathology, Post-mortem examinations, Bacteriology, the preparation of vaccines (smallpox, rabies, T.A.B.), anti-amaryl inoculation for the Lagos Area, the teaching of Pathology, Bacteriology and Parasitology in the Medical School and the training of technical assistants.

Expansion of the work outside Lagos has included inspections of the African Hospital, Port Harcourt, the African Hospital Laboratory, Zaria, the posting of a technical assistant to Ilorin and in Lagos the planning of a new office block for future development. The Assistant Director of Laboratory Service was one of the Nigerian representatives who attended the Anglo-French Medical Conference at Accra in November, 1946.

The work done during the year in the Lagos Areas included :—

Blood Examinations, 8,052 (with approximately 12 per cent positive for plasmodium falciparum)

Faeces Examinations, 7,260 (with predominant findings ascaris, hookworm and trichuris infestation)

Urine Examinations, 6,169. Urethral smears, 5,870 (with 50 per cent positive for Gono-cocci)

Examinations of sputa, 4,286 (with 16 per cent positive for tuberculosis)

Skin and Nasal Smears for Leprosy, 124 (with 12 per cent positives)

Examinations of blood for sickling, 137 (with 38 per cent positive)

Biochemistry Examinations of various types 218. Ascheim Zondek tests 66 and miscellaneous examinations 407.

Histo-pathological Examinations of 956 tissues were made, excluding special work on 1,241 blocks of rat tissues for liver and yellow fever research. Malignancy in tumours was noted in 131 cases, the most frequent occurrences being of squamous carcinoma of the skin (25 per cent) of the uterus (15 per cent) and melanomata (about 12 per cent).

Yellow Fever.—Twenty specimens of suspected liver were examined and ten found positive (the first positives since 1942). The positive cases were from areas far apart, namely, Gusau, Ilorin, Kafanchan, Ogbomosho and Oshogbo.

Post-mortem Examinations totalled 556; 150 for the Health Authorities, and causes of deaths can be subdivided into respiratory system 123, cardio-vascular system forty-seven, alimentary system sixty-seven, Genito-urinary system twenty-three, diseases of liver, thirteen, diseases of blood thirteen, diseases of nervous system thirty-four, tuberculosis fifty-seven, infectious diseases thirty-two, and miscellaneous 146.

Bacteriology.—A total of 1,273 agglutination tests were performed, 520 for salmonella and enteric type organisms (eighty-five positive) 198 for brucellosis (four positive) and 544 for the Weil Felix reaction (with Proteus OXK positive seven, Proteus OX-2 positive one, and forty-seven positive Proteus OX 19. Eleven Rickettsial agglutinations done were all

positive. There were also performed, Kahn examinations 5,947, Ide tests 486, cultures of various types 954 and miscellaneous tests 551 including throat swabs, anthrax and cattle agglutinations.

The following antigens and media were prepared : Kahn 740 ml., Ide 1,874 ml., Culture media of different types 293,260 ml., of which 53,020 ml. was for Army use. In addition 54,900 ml. of stains and solutions were prepared.

Vaccines.—Smallpox Vaccine—The yield of pulp was 19,251 grms. from 524 sheep, an average of 36.5 grms. per sheep. Mortality rate in sheep was the lowest ever recorded, due to improved care and rapid usage of animals. The average success rate with vaccines was over 90 per cent in eighty-two batches tested, and further tests on keeping exposed to various conditions showed little loss of potency. Vaccines issued in 1946 totalled 112,986 tubes for civilian use in Nigeria, Sierra Leone, and Liberia, and 2,850 for military use, equal to 2,316,720 single insertion doses, with a total value of £11,583 12s. The estimated annual production is up to 4,000,000 single insertion doses. Additional buildings and refrigeration plant were either completed or in the process of installation during the year.

Rabies Vaccine.—76,370 c.c. were prepared from thirty-nine sheep and 52,090 c.c. issued to Nigeria, 12,915 c.c. to Gold Coast, 810 c.c. to Sierra Leone, and 1,240 c.c. for military use.

T.A.B. Vaccine.—3,375 c.c. were prepared and issued.

Yellow Fever Inoculation.—A total of 1,545 were given with Rockefeller Vaccines (apart from mass inoculations elsewhere).

Teaching and Training.—Owing to staff shortages and invalidings, some difficulty has been experienced in completing the Medical School curriculum. Four students out of six passed the 2nd Professional Examination (Part II) in Pathology, Bacteriology and Parasitology.

The training of Technical Staff has been much more satisfactory and will undoubtedly lead to increased efficiency in out-station work.

Special Investigations.—These consisted of field work in connection with the outbreak of yellow fever at Ogbomosho in association with the Yellow Fever Research Institute ; work by Dr. Cannon on Histology of liver in West Africans and nutrition experiments in albino rats has continued.

Out-Stations.—Out-station staff consists of one Laboratory Superintendent and thirteen Technical Assistants at Port Harcourt, Kaduna, Kano, Zaria, Jos, Maiduguri, Calabar, Enugu, Victoria and Ilorin, in which the following examinations were made : Bloods 30,106 (with approximately 25 per cent positive *P. falciparum*), Urines 21,958, Faeces 23,260, Kahn Tests 1,578, Ide Tests 3,310, Agglutination Tests forty, Tests for sickling twenty-two, Sputum Examinations 3,126 (with 12 per cent positive T.B.) and miscellaneous smears and examinations 7,781 in addition ; 257 Post-mortem were performed.

MEDICAL AND PHARMACY SCHOOLS

The post of Principal still continues vacant, the duties being carried on by the Assistant Principal. There has been some difficulty in the continuity of teaching in anatomy, but a full-time teacher has been recently appointed. A useful addition to the staff is that of a lecturer in Biochemistry (part-time). There has been considerable help from medical personnel of the 68th General Hospital, which is likely to be absent in the future.

Buildings.—A new biochemistry block with office accommodation is almost completed, and includes two Laboratories, Students' common room and stores. It is now awaiting equipment. The position in regard to equipment has been worse in respect of supply and price than ever before.

Students.—Students admitted during the year to classes were ten in number and the numbers attending were as follows :—

1st year 11 : 2nd year 6 : 3rd year 3 :

4th year 5 : 5th year 6 : and 6th year 3.

Two students obtained the diploma during the year bringing the total number of graduates now to forty-two. It is regretted that only three students have obtained the diploma in the last two years and this would seem to stress the necessity for at least two full-time teachers for the clinical part of the course and the encouragement of a corporate life and spirit in the school.

School of Pharmacy

The staff consisted of one Superintendent and four Masters, the Superintendent on a part time basis since February, 1946. Classes in attendance (Chemists and Druggists Examination) were, Part II, twenty-six ; Part I, seventeen. In examinations held during the year, Part I—fourteen passed out of nineteen candidates and Part II—eleven passed out of thirteen candidates. A full-time Superintendent arrived in December.

Hydnocarpus Oil Preparations

During the year, 2,837 bottles of sterile oil with 4 per cent creosote were sent to Medical Stores. Improvement in the quality of the Oil has been produced by steam passage to obviate unpleasant reactions. In addition glucose-salines, salines and morphine Hydnocloride solutions have been routinely prepared as requested for use, as have dusting powders and brilliant green solution for vaccination purposes. This manufacturing work throws some strain on inadequate facilities to the detriment of the School's proper function.

Dental Service Report

The staff position has improved and there are now five Government Dental Officers in the country—at Lagos (two), Enugu, Kaduna and Jos. A European Dental Mechanic for the training of African Dental Assistants arrived in August and there are now six pupils in training. Provision of suitable buildings and equipment for the extended service seems an urgent need. Progress in dental work has been marked with the present number of 1,708 and 2,656 European and African patients in the Lagos Books and 470 cases outside the Colony. There have been bi-weekly Dental Clinics instituted at the African Hospital and in-patient beds allocated.

School Examinations have been made and it has been noted that the high percentage of 80 per cent required treatment. This work is being extended.

Training of Medical Students in Dental Work, with demonstrations, carried on as before and a portable X-Ray Unit has been installed in the Surgery, Lagos. A mobile dental unit is suggested to facilitate area treatment. Dental stores have been separated from Medical Stores.

The following are the figures for 1946 :—

			<i>Lagos</i>	<i>Enugu</i>	<i>Jos</i>	<i>Kaduna</i>	<i>Totals</i>
Extractions	..	..	1,756	106	430	207	2,499
Fillings	..	..	1,099	94	321	253	1,767
Scalings	..	..	578	21	120	91	800
Dentures..	..	..	376	17	81	—	474
Repairs	..	..	176	—	15	—	191
New Patients	..	..	1,702	105	120	91	2,018
Total treatments	..		4,905	189	240	720	6,054

Minesfield Medical Facilities

The following are the comparative attendance figures for 1945 and 1946 :—

	1945	1946
New out-patients	9,373	8,708
New in-patients	2,235	1,177
Total attendances	26,350	21,538
Ante-natal cases	86	264
Surgical out-patients	273	333

Of the attendances, 7,175 came from the Mines and 14,363 from the local population as against 7,786 and 18,564 for 1945.

It is to be noted that the so-called local population coming for treatment is largely of Southern origin.

Ante-natal cases have gone up considerably and are almost entirely Southern natives. The most prevalent diseases have been Helminthic infestations, dysenteries and venereal diseases, the latter especially from sulpha-resistant Gonococci. No serious epidemic occurred.

IGBOBI ORTHOPAEDIC HOSPITAL AND REHABILITATION CENTRE.

This Hospital with sixty beds and facilities for treatment of 240 ambulant cases has now been taken over by the Central Government. Originally intended for Ex-Servicemen, it is being found useful as a centre for orthopaedic work, physiotherapy, occupational therapy and the provision of artificial limbs for civilian use as well as for ex-service personnel. It has also been found useful in the treatment of bone tuberculosis and has been staffed by an orthopaedic Surgical Specialist, a Senior Nursing Sister, two Physiotherapists and five Limb Fitters. Out of a total of 114 patients, only six were ex-servicemen in-patients, at the end of the year. During the year 135 ex-servicemen were treated, forty with prosthesis.

An X-Ray plant has been installed and theatre equipment sufficient for present purposes.

Training of twelve Africans on a three-year course in physiotherapy is now in progress. African staff includes fourteen trained nurses and twelve ex-army nursing orderlies. Provision has been made for social facilities as well as actual technical work. This will be a special treatment centre for the whole of Nigeria and plans are in hand to replace the temporary billets by proper ward blocks but the work of reconstruction may take some years to execute in view of the shortage of Public Works staff and of materials.

An Anglo-French Medical Conference, held at Accra in 1946, at which British West African Territories, including Nigeria, were represented reached the following main conclusions in unanimous and cordial agreement :—

- (1) that there should be complete co-operation of services where and when required, with the continuation and extension of personal contacts.
- (2) that, in the event of epidemic emergencies, there should be interchange of drugs and equipment where this was possible, and the availability of concerted action, early and rapidly, between respective local and central medical authorities, with interchange of personnel if necessary.
- (3) that provision should be made for educational standards of staff training and education progress for the African people in general to ensure appropriate social standards for qualified Africans.

- (4) that the extended use of accredited laboratories (including Lagos) for the histopathological diagnosis of Yellow Fever should be continued with interchange of material and views of the personnel concerned.
- (5) that the preparation and use of specific vaccines, etc., should be continued and made interchangeable in areas, if and when required.
- (6) that there should be facilities for the interchange of information on nutritional policy, particularly in regard to the correct approach in dealing with large scale nutritional deficiencies.

In general the continuation of the existing contacts were encouraged and stress laid on the extension of co-operation between respective Directors of Medical Services and their representatives of adjoining areas for the increased benefit of the territories involved.

The following are the meteorological returns for 1946 :—

<i>Station</i>	<i>Absolute Shade Max.</i>	<i>Absolute Shade Min.</i>	<i>Mean Max.</i>	<i>Mean Min.</i>	<i>Mean rel. Humidity</i>	<i>Total Rainfall</i>
Calabar	96	67	86.0	73.4	97	96.89
Enugu	99	66	88.1	72.4	90	67.36
Ibadan	99	50	88.4	68.5	98	37.86
Ilorin	103	54	90.5	70.6	87	33.69
Kaduna	100	52	87.8	65.4	72	58.36
Kano	106	50	91.0	66.2	63	41.54
Lagos (Ikeja) ..	96	59	87.3	71.2	98	38.50
Lokoja	102	59	90.1	73.3	89	35.30
Maiduguri ..	109	47	93.6	66.3	66	30.27
Yola	109	61	94.5	72.2	67	37.14

SLEEPING SICKNESS SERVICE

ANNUAL REPORT, 1946

The staff position was even worse than in previous years. Towards the end of the year thirty-five Dispensary Attendants were released from the Forces. They will not all be available for field work until well into 1947. In recent years, except for work in the Benue-Ogoja Provinces and in the restricted mining areas, much of the dispensary work, together with the arranging of sleeping sickness surveys and of clearance campaigns has to be centralized and administered from the Kaduna Office. Anticipating a full European and African staff in 1947, it has now been possible to make the initial movement towards decentralization.

Despite the depleted staff, who had much added work in connection with the training of the new Medical Department Field Units, a Yellow Fever outbreak in the Western Province, and development schemes in the Northern Provinces, the treatment section examined over half a million people. This is considerably more than in the peak year of mass examination, 1936, when 417,495 people were seen, and when five full teams, each under a Medical Officer, were in the field. The burden of treatment is, of course, now somewhat smaller. 13,339 cases were treated by teams, at dispensaries and in mining camps, as compared to 58,000 in 1936; but the 1936 cases were concentrated and not widely dispersed in small groups as they are now. Towards the end of 1946 the staff position was unfortunately such that the introduction of a new system of control in the special mining areas and the protective clearance campaign in Katsina and Kano had to be rather neglected.

I.—SLEEPING SICKNESS

Detailed figures are given in an appendix. The total number of cases treated increased by 1,400 to 16,723. Hospital figures rose slightly, mainly due to the number of cases reported from Hadejia, Kano Province. The total of survey cases is up by 1,700 following extensive surveys made in Katsina. Dispensary and mines figures continue to fall.

No surveys were undertaken in new areas. Re-surveys were made by numerous small teams in seven of the northern and one of the southern provinces. The bulk of the work was in Katsina where 2,291 cases were diagnosed in the 207,846 people examined. In the Galadima (Mallamfashi) district, where high rates were being found at the end of 1945, the combined 1945-46 figures are :—

<i>No. examined</i>	<i>S.S. Cases</i>	<i>Infection per cent</i>
70,658	2,004	2.8

In eleven of the twenty-one village areas the incidence was under 2 per cent ; in six it lay between 2 per cent and five per cent ; and in the remaining four village areas, from which more than half the total cases came, it was over five per cent (5.8-11.7). After the survey a temporary dispensary was opened in June. Here, by the end of the year, another 197 cases began treatment ; none of these were relapses. Tsetse control measures were also begun in the worst areas.

In the four other Katsina districts surveyed, the infection rates were : Kogo—0.1 per cent ; Dan Ja—0.9 per cent ; Musawa—0.1 per cent, Kankara—0.9 per cent. The original surveys of these districts, 1936-1938, revealed rates of 9 per cent, 7 per cent, 1 per cent, and 11 per cent respectively. Since then there has been no follow-up dispensary treatment as in other endemic areas, but clearance measures were undertaken from 1938 onwards. In Dan Ja and Kankara the type of clearing originally made was unorthodox and is now prohibited. It gave some protection. Where it has been extended and improved on more orthodox, ruthless, lines, it has undoubtedly given a high degree of protection. In some Dan Ja villages, where clearings had been ineffective or non-existent, there has been a persistent moderate incidence of sleeping sickness with a fall in population, contrasting with a rising population in the well cleared hamlets, which have a negligible amount of the disease.

The district of Karayi in Kano bordering on the Galadiman Katsina district was surveyed to make certain that the infection had not spread from the very highly infected Katsina villages along the provincial boundary. The incidence was low, 0.5 per cent in 32,000 examinations. There has never been much sleeping sickness in this district. In 1938 the rate was only 1.7 per cent and, coincident with mass treatment, the Medical Officer had numbers of protective clearings made.

In the more central endemic areas, in Zaria, Plateau, Niger and Bauchi Provinces, most routine re-surveys gave rates round 1 per cent. More highly infected foci are known to exist, especially in Plateau and Bauchi. The position is similar in Benue Province, where the over-all incidence at surveys was 0.9 per cent, including known residual pockets in Wukari Division. A survey of south-eastern Wukari, including parts of mandated territory, showed, that the vast improvement made by the first mass survey of 1939 had been maintained. There were only sixty-five new cases in 13,000 people, and a complete absence of infection in three small districts. In this region, however, especially beyond the palm-oil area, the avitaminoses are common, and goitre is highly endemic in the hills. Arrangements are being made to facilitate the supply of iodized salt, available already in other parts of Benue Province,

At a re-survey in Ogoja Province, attendances were poor. The infection rate was 0.6 per cent, approximately the same as in the original survey of 1945 in the same village areas. In eighteen cases lumbar punctured, the spinal fluid was abnormal in fifteen. The Senior Leprosy Officer was present at this survey and gave advice as to the diagnosis of leprosy. In one area where the whole population attended, it was estimated that the leprosy rate was 8 per 1,000. In general, the standard of health in the Obudu Division of Ogoja is low. Yaws, helminthic infestations and scabies are common, and many people suffer from orthopaedic deformities. Since the 1945 survey, the Native Administration has built two dispensaries, to which sleeping sickness staff is posted. A third is to be erected.

The inclusive figures for all team re-surveys are :—

<i>No. examined</i>	<i>S.S.</i>	<i>Infection per cent</i>
357,721	3,503	0.98

Village re-surveys done by dispensary staff in co-operation with Native Administration officials were mentioned in the 1945 report. During 1946, 115,578 people were examined at such surveys and 1,080 (0.93 per cent) early cases brought to treatment.

The Sleeping Sickness Service controls fifty-one dispensaries, some of which have a double staff, and a variable number of temporary dressing stations, mostly in the minesfields. Treatment is available at thirty-eight Native Administration dispensaries, to twenty of which special sleeping sickness staff is posted. Cases of trypanosomiasis were recorded at thirty-four hospitals, Government or Native Administration, and at four mission stations.

The fifty-one Sleeping Sickness dispensaries treated some 100,000 patients, almost all of whom were examined as a routine for trypanosomiasis ; this figure is not included in the total of examinations made. At the fourteen Benue Province dispensaries among 53,064 people attending, 20,003 had yaws and 1,571 trypanosomiasis. Of the latter, 333 were cases found at village re-surveys in which 31,687 people were seen (1.05 per cent). The corresponding figure for team re-surveys in this province was 0.9 per cent ; 750 cases in 81,869 people. The proportion of sleeping sickness to all diseases seen at dispensaries varied from 0.8 per cent to 2.6 per cent being highest in Wukari Division.

In Zaria Province there are sixteen sleeping sickness dispensaries. In this partly Moslem area, where yaws is absent or rare, fewer people attend than in Benue. The proportion of sleeping sickness to all diseases is higher, 1,866 out of 27,115, or almost 7 per cent. The incidence of meningitis and smallpox in Zaria was less this year, 162 and 351 cases respectively, and the number of vaccinations done by sleeping sickness staff was doubled, reaching 30,226. Included in the cases of trypanosomiasis treated are 621 diagnosed at village surveys. 0.8 per cent of the 76,749 people seen. This rate is exactly the same as for team surveys in Zaria.

The total number of sleeping sickness cases treated at all dispensaries has fallen from 13,100 in 1943 to 9,661 in 1946. It should continue to fall in the central endemic areas as the special dispensary staff is released from general medical and anti-epidemic work to concentrate on village re-surveys. In districts where the voluntary, more advanced, and therefore less curable cases attend badly, it may be necessary to withdraw some of the dispensary staff and concentrate on widespread re-surveys, at which intensive and regular treatment of all cases can be enforced by even the poorly organized Native Administration.

The mines labour force controlled has fallen to about 4,500, but is still scattered in at least ninety-five camps in the four restricted areas. 35,446 examinations were made, approximately eight per man per year, and 227 infections found. This represents an index of new infections of 0.6 per cent occurring every six weeks or about 5 per cent per year. The

incidence in the surrounding peasant populations varies from below 0.5 per cent to around two per cent in surveys made at intervals of several years. The index of new infections remains high in the Niger and Kabba-Ilorin camps, but the labour force at risk is now very small, and there is no evidence either of the epidemic conditions existing six years ago, or of spread of the more virulent mining camps infections to the local population. The shifting nature of the labour in Jamaa camps keeps the index here around one per cent as compared to a third of this figure in the better organized Wamba labour force.

Trials with Pentamidine as a prophylactic were mentioned in the 1944 report. These continued on a small scale throughout 1945. Originally 0.10 gm. of Oentamidine was given intramuscularly, later 0.20 or 0.25 gm. of Pentamidine Isethionate. No case of new infection has yet been seen in those given Pentamidine and presented for regular examination for periods varying from six months to a year. A report of possible cryptic infection was investigated; among the suspects the only one with trypanosomiasis had had symptoms, and had been subjected to gland puncture with negative results, before receiving Pentamidine. He had the typical symptoms and signs of a moderately advanced infection with minor changes in the C.S.F., but his glands and blood remained tryp-negative. In 1946 the use of Pentamidine Isethionate on a large scale was planned, but had to be partly abandoned owing to lack of European staff and absence of compulsory powers which are now being sought. The use of Pentamidine is now normal procedure in a number of Wamba camps. It is given on engagement and, thereafter, every four to five months. Pentamidine obviously gives better results as a prophylactic than did Antrypol in 1936 in the same area, but the infection rate is already so low from the regular six-weekly examination system that some time will have to elapse before conclusive figures are obtained. The use of Pentamidine should release staff from the Wamba area for work elsewhere.

Large scale field trials with Pentamidine, Melarsen and Melarsen Oxide, controls being on Antrypol followed by Tryparsamide or on a synergic mixture of the latter two drugs had to be postponed until early 1947 but 800 cases in Katsina have been left for this work. Owing to the delay some useful information regarding the death rate in untreated cases and of the rate of onset of C.S.F. changes may be obtained.

Notes on drug trials are given in an appendix.

II.—COMMUNAL PROTECTIVE CLEARANCE

Zaria Province.—A few extensions, totalling two and a half miles, were required to clearings in Giwa. In the Homo District an additional mile of clearing was made to protect the Veterinary Inoculation Camp at Yelwa.

Katsina Province.—The dangerous focus, mentioned in the 1945 reports in the un-cleared district of Galadima (Mallamfashi), produced just over 2,000 cases of sleeping sickness. By April, despite a late start, fifty-five miles of stream had been ruthlessly cleared around the most highly infected villages. The completion of work in this district has had to be postponed until early 1947 because of sickness and leave incidence in European staff.

In the neighbouring district of Dan Ja (Bakori), where a system of partial clearance similar to that used at Anchau, but without the essential barriers, had been used, and where some villages found to have little or no sleeping sickness at the 1936 survey were not protected, old clearings were improved, and new ruthless clearings, ten miles in length, were made. A mile-long barrier clearance was made in Kogo district to give added protection to the Daudawa Agricultural Settlement.

Kano Province.—In the four districts of Karayi, Gwarzo, Sumaila and Rano, a total of 137 miles of clearance was made. More than half of this was re-clearance of old

work done by S.S. Medical Officers and by Kano Native Administration between 1928 and 1935, before the present scheme began, and which had not been regularly re-slashed.

Sokoto Province.—Extensive clearings done by Administrative Officers in south-western Sokoto in 1936, and which have since been maintained by a Native Administrative headman, were found to be in very satisfactory condition. It was difficult to differentiate between the naturally and the man-made tsetse-free stretches of the Niger river, and there were no signs of increased erosion. A few clearings, where re-slashing had been neglected in late years, harboured fly, and others required extension.

In this provinces, and in Plateau and Bauchi, the re-slashing of clearings was organized and inspected. Numerous fly surveys were carried out, particularly in connection with development schemes in Niger and Plateau Provinces, and in areas previously cleared or scheduled for clearance in the near future.

The problem of rapid regeneration from the stumps of the Tukurua palm (*Raphia vinifera*), common in streams south of Zaria and infested with *G. palpalis*, appears to have been solved as a result of experiments carried out by a control officer. Earlier attempts to kill the stump by driving in a stake, just before or during the rains, failed, and recourse was had to laborious digging out of roots and stumps. It has now been shown that careful positioning of the stake in the true heart of the stump will lead to complete rotting. A method, even more efficient and much simpler especially where supervision is minimal, as it usually has to be, is to make a hole with a crow bar in the heart of each palm sucker and to pour in a few ounces of cotton tar.

III:—THE ANCHAU TSETSE-FREE CORRIDOR

In the Ikara district, using communal instead of paid labour, twenty-four miles of stream were partially cleared and three miles of ruthless barriers made. Here, and in Anchau, annual re-slashing was reasonably well done and wet season fly rounds showed all streams in the corridor to be tsetse-free.

By May, when the main well-sinking programme finished, fifteen new shafts had been completed. Equipment was then loaned for sinking operations elsewhere in Zaria Province and in south-western Kano near Anchau.

The ten village schools remained open. The average roll consists of about twenty-eight children and twenty-one adults, the latter attending poorly. During the year fifty-two adults and fifty-eight children passed an examination on completing their course. Three of the children now attend the district elementary school and others appear at the evening adult classes in their own villages.

The provincial propaganda team was disbanded temporarily due to lack of European staff. The Anchau team remained at work in corridor villages. They report continued general improvement in hygienic and agricultural standards. In the wet season they planted 600 fruit and 200 shade trees. As literacy and the supply of instructive literature improves the need for these teams should decrease.

Wet season inspection of villages showed that conditions in Rikochi village had deteriorated despite attempts at drainage. Stone and cement plinths are to be provided here for the damper huts.

A survey of farmlands and housing in the new village of Rafin Gaudo affirmed the accuracy of the original estimates made by Dr Nash and his staff before movement of population was attempted. Figures are :—

	1938-39	1946
	<i>Estimate</i>	<i>Survey</i>
Average size of family	7.4	7.2
Average huts per compound	3.5	4.4
Average people per hut	2.2	1.6
Acreage cultivated per adult male	—	5.75
Acreage cultivated per head	2-2.5	1.9

The population of the village has increased from 189 to 230, partly from immigration. The increase in the number of huts per person indicates improved economic and health standards. The slightly lower acreage cultivated is understandable since many of the farms are on new land.

The health of farm and village livestock has been good. Five hundred of the 600 pigs sold, mostly to the Agriculture Department, came from the thirty-nine village pig-keepers, who received £440 cash for them. This local industry should continue to thrive if the Anchau-Duchinwai road is kept open throughout the year, which, at present, seems unlikely. Sixty-four farmers now tend eighty-two cattle supplied from the stock farm as the nuclei of village herds, and it is hoped that more cattle will be obtained from Veterinary Headquarters in 1947. The replacement of the local goat of mixed ancestry by the purer 'Zaria Red' continues slowly. With increased distribution of stock to villages, the land cultivated at the farm for fodder crops was reduced from forty-five to thirty-five acres, producing over four tons of grain and twelve tons of hay in addition to part of the large quantity of silage made. The annual veterinary camp attracted 14,500 cattle for immunization. At the veterinary Clinic 850 cattle, 143 from the district and 707 from Fulani herds, were treated for trypanosomiasis, with ten deaths. 348 animals, mostly goats, were treated for worms, the majority with Phenethiazine, and 974 goats and eleven cattle were castrated. A further 564 domestic animals attended for various other diseases. Fulani, stock farm and mixed farmers' cattle were inoculated against Blackwater, stock farm cattle and goats against Pleuro-pneumonia, and poultry against fowl typhoid.

I.—CASES OF TRYPANOSOMIASIS TREATED IN NIGERIA

	1943	1944	1945	1946
New Surveys	} 5,321	{ —	624	—
Re-Surveys			1,174	3,503
Dispensaries			10,126	9,707
Mines Labour			293	277
Hospitals, etc.			3,107	3,286
Total Examinations made ..	197,307	182,914	281,493	508,745

II.—TEAM RE-SURVEYS—1946

	<i>No. Examined</i>	<i>S.S. Cases</i>	<i>Infection %</i>
Katsina	207,846	2,291	1.1
Kano	31,982	167	0.5
Sokoto	253	7	2.8
Zaria	26,147	201	0.8
Niger	5,021	45	0.9
Bauchi	1,088	20	1.8
Benue	81,869	750	0.9
Ogoja	3,515	22	0.6
Total	357,721	3,503	0.98

III.—DISPENSARY RE-SURVEYS—1946

	<i>No. Examined</i>	<i>S.S. Cases</i>	<i>Infection %</i>
Kano	5,436	80	1.5
Zaria	76,749	621	0.8
Bauchi	1,706	46	2.7
Benue	31,687	333	1.05
Total	115,578	1,080	0.93

IV.—MINES LABOUR—1946

<i>Restricted Area</i>	<i>No. of Examinations</i>	<i>S.S. Cases</i>	<i>Infection %</i>
Kabba-Ilorin	1,797	23	1.3
Niger	4,193	43	1.0
Wamba (Plateau)	19,935	64	0.3
Jema'a (Plateau)	9,719	97	1.0
Total	35,644	227	3.6

V.—DISTRIBUTION OF ALL CASES OF TRYPANOSOMIASIS

(a) NORTHERN PROVINCES

Province	S.S. Service			N.A.			Totals
	Surveys	Mines	Dispensaries	Dispensaries	Hospitals	Missions	
Katsina	2,291	—	—	197	42	—	2,530
Kano	167	—	819	—	905	—	1,891
Bornu	—	—	—	9	—	—	9
Sokoto	7	—	—	46	13	—	66
Zaria	201	—	1,899	128	60	60	2,348
Niger	45	43	21	122	147	—	378
Plateau	—	161	992	1,147	657	374	3,331
Bauchi	20	—	511	199	212	—	942
Adamawa	—	—	—	—	—	—	—
Benue	750	—	1,571	1,572	297	432	4,622
Kabba }	—	23	—	—	{ 12	{ —	44
Ilorin }					9		
Total, N.P. ..	3,481	227	5,813	3,420	2,354	866	16,161

(b) SOUTHERN PROVINCES

Ogoja	22	—	—	384	9	—	415
Cameroons ..	—	—	—	49	20	—	69
Owerri	—	—	—	41	9	—	50
Calabar	—	—	—	—	17	—	17
Other Provinces ..	—	—	—	—	11	—	11
Total, S.P. ..	22	—	—	474	66	—	562

(c) SUMMARY

Total, N.P. ..	3,481	227	5,813	3,420	2,354	866	16,161
Total, S.P. ..	22	—	—	474	66	—	562
Total, Nigeria ..	3,503	227	5,813	3,894	2,420	866	16,723

DRUG TRIALS

The large groups of early cases treated in 1944 with 70A (Butarsen) could not be given their final two-year examination. Further small groups were given Butarsen alone or Butarsen plus small doses of Tryparsamide and were followed up for a year. Early gland-positive cases, C.S.F. normal or with not more than 5 cells per cmm., did well on Butarsen alone. Of the cases on Butarsen plus Tryparsamide, results were good in twelve out of fourteen who had a C.S.F. with total Protein (Sicard Canteloube) of under 30 mgm. per cent but were poor in those whose total Protein originally exceeded this figure. A mixed batch of new and relapsed cases were given Butarsen only. Two had C.S.F. normal or nearly so reacted well, as would be expected. The remaining eighteen fared badly. Seven died and, at the last visit, two were too ill to attend and another had left the district. The worst cases had then to be given standard synergic Antrypol-Tryparsamide treatment, which gave dramatic results in five cases. Their average C.S.F. findings of 259 cells per cmm. and total Protein of 33 mgm. became 39 cells and 33 mgm. respectively, including two completely normal fluids. These figures were obtained shortly after the completion of synergic treatment and may later improve.

At Maijama'a, near Kaduna, seven gland-positive survey cases were given Melarsen, 1 gm. every five days for twelve injections, and seven comparable cases a similar course of 2 gm. doses of Tryparsamide. The average C.S.F., almost identical in the two groups, was 15 cells and 21 mgm. total Protein. There were no upsets during treatment. Five months after treatment finished, two of the Tryparsamide cases had soft cervical glands swarming with trypanosomes. The others were well and had no parasites in thick films or in gland juice, if this latter could be obtained. The two relapses were given a half dose of Malarsen, which sterilized them, and were then put on full Melarsen treatment.

The Melarsen Oxide supplied is dissolved in propylene glycol and is difficult to handle when fractional amounts are given. In doses of 2.5 to 7.5 mgm., it is powerfully trypanocidal. At Kenti, in the Wukari Division of Benue Province, twenty-six cases, average C.S.F. 58 cells per cmm. were given this drug, and twenty-five controls, average C.S.F. 41 cells were given Mapharside, one injection of either drug daily for seven days. With Melarsen Oxide there were two cases of encephalopathy and one who developed thrombophlebitis. One Mapharside case had a nitritoid crisis; and four had severe headache or impending encephalopathy necessitating withdrawal or postponement of treatment. In all cases trypanosomes had disappeared from gland juice within twenty-four hours and all gland punctures done at the end of treatment were negative. The fall in the E.S.R. at the close of treatment was not significant, but it usually requires several weeks for significant changes to develop.

With the higher dosage of Pentamidine or of its Isethionate now given by intramuscular injection, results with this drug alone have been surprisingly good, even in cases with some evidence of meningo encephalitis. Intensive courses lasting seven to ten days, using Pentamidine and Tryparsamide are therefore being tried, and compared with similar intensive Antrypol-Tryparsamide courses. For cases with less than 10 cells per cmm. in the C.S.F., Pentamidine 1.3 gm. or Antrypol 3.2 gm. is given with Tryparsamide 6 gm., within seven to ten days. With higher cell counts the amount of Tryparsamide is increased. At Kujama, near Kaduna, twenty-six survey cases were given the Pentamidine-Tryparsamide course, and twenty-four comparable cases the Antrypol-Tryparsamide regime. In each group the average C.S.F. cell count was 13.5 per cmm. Seven months afterwards forty-nine of the cases were seen. All seemed well, without clinical evidence of relapse, and none had parasites in gland juice, if obtainable, or in blood films. Most of the women were pregnant, usually an indication of successful treatment.

ARSENOXIDES IN YAWS

In Benue Province thirty-two cases of yaws were given intensive one-day arsenotherapy, four injections of NeoHalarsine at two-hourly intervals, plus one injection of bismuth. Three had headache the day after treatment and one persistent slight headache for a week. The most important limiting factors are the inaccessibility of veins in very small children, who form a high proportion of cases, and the possibility of having to reduce the dosage considerably in yaws areas with a nutritional standard lower than that in the district chosen. The presence of a palpable liver and spleen did not seem a contra-indication.

Five weeks after treatment the lesions in three primary and eighteen secondary cases were healed in fifteen and healing in the other six; fourteen had a positive Ide serum test before, and only five after treatment. Eight of the eleven tertiary cases were healed or healing, and the number of negative Ide tests had risen from five to seven. Three tertiary cases were unchanged. In four cases given weekly bismuth injections only, one was healing, one had lesions still present, and two had new eruptions. Lesions were little changed in three untreated cases.



